The present invention relates to an aqueous sizing dispersion comprising a sizing agent, starch having aromatic groups containing less than 95 weight % of amylopectin and condensed sulfonate. The invention further also refers to a method of sizing paper comprising adding the above dispersion to a cellulosic suspension having a conductivity of at least 0.5 mS/cm.

It has surprisingly been found that the combination of starch having aromatic groups containing less than 95 weight % of amylopectin and condensed sulfonate in an aqueous dispersion renders significantly improved sizing results, specifically when applied on cellulosic stocks having high conductivities.

Condensed sulfonates are a class of compounds which commonly are obtained by condensation of salts of sulfonic acids, i.e. compounds in which a hydroxysulfonyl group is bonded via the sulfur atom directly to a carbon atom of the hydrogen residue. Normally an aldehyde is present during the condensation process wherein polymeric sulfonates are formed. Specifically favourable sulfonates are aromatic sulfonates formed by condensing aromatic sulfonic acids, such as naphthalene sulfonic acid, and aldehydes. Obviously, the term "condensed sulfonates" has, in the context of the present invention, the meaning of synthetically form sulfonates, contrary to e.g. lignin sulfonates which are naturally occuring sulfonates found in hard wood and soft wood species.

In example 2, a high conductivity suspension was sized by the addition of a dispersion comprising condensed naphtalene sulfonate, aromatic starch containing less than 95 weight % of amylopectin and AKD, whereas in example 4 a sizing dispersion comprising lignosulphonate, starch and AKD was added to a similar suspension as used in example 2.

Comparing the sizing results of examples 2 and 4 (tables 2 and 4), it is evident that the addition of a dispersion containing aromatic groups containing less

than 95 weight % and condensed sulfonate provides significantly better sizing than the addition of a dispersion comprising lignosulfonate at similar dosages. The addition of 0.125 kg sizing agent of the novel dispersion results in a cobb value of 33 (table2), whereas the addition of a similar amount of a lignosulfonate-containing dispersion only yields a cobb value of 42.

According to the Action, the most relevant document is Ueda which describes the use of specific cationised starches for improving emulsification stability. Said stability can be improved if a phenyl group, benzyl group and/or cyclohexyl group is bonded to the nitrogen atom of the amino group which exhibits the cationic property of the cationised starch (p. 5). The sole objective with the Ueda dispersion is to solve the problem of emulsification stability. However, Ueda is totally silent about improving sizing of furnishes, let alone sizing of high conductivity furnishes. What is more, the important technical feature to overcome said problem is to apply specific starches (p. 10, par. 10, The sizing agent for paper making of this invention can be obtained by adding a cationic starch derivative as an emulsification stabiliser...*used as the main component.*). It is not even important that the starches are aromatic, as also non-aromatic cyclohexyl group substituted cationic starches can be used (p. 5). Apart from the starches, Ueda also discloses a wide variety of other compounds which can be used in conjunction with the starch, however, non of them being indicated as specifically preferred. One group of compounds which may be used are ligninsulfonates. Yet, Ueda is silent about using condensed sulfonates.

To sum up, the present invention is both novel and non-obvious with regard to Ueda.

Blixt deals with sizing dispersions which will improve sizing of paper, without mentioning high conductivity paper furnish grades, and reducing the negative effect on optical brighteners. According to Blixt, the drawbacks are overcome by providing a certain type of cationic starch in combination with a hydrophobic cellulose-reactive

sizing agent. The important technical features of the Blixt dispersions are the presence of starch possessing a combination of (A) a highly branched, high molecular weight structure and a degree of cationic substitution in the range of 0.045 to 0.4. Although the starch obviously contain an amylpectin content of less than 95 %, Blixt does not disclose nor recommend aromatic starches containing less than 95 weight % of amylopectine.

Neither of Ueda and Blixt deal with the problem of improving sizing of high-conductivity furnishes, in addition, neither of them discloses that a combination of starch having aromatic groups containing less than 95 weight % of amylopectin and condensed sulfonate would be a specifically preferred embodiment. Separate features from two or more documents at random cannot be combined without the suggestion to make such combination. In the absence of such suggestion, there only remains the present invention which cannot be used as a template to reconstruct itself from the prior art.

The same argumentation as provided for the combination of Ueda and Blixt is also valid for the combination of Ueda, Blixt and Savina and/or Persson. In these rejections, yet a third document is introduced in order to argue the obviousness of the present invention. Instead, the introduction of Savina or Persson, is, in itself an indication for the presence of an inventive step. It is submitted that once again the features of the present claimed invention have been arbitrarily combined, such as the concept of high conductivity from Persson with, e.g., the starches of Blixt, without any suggestion to make the combination.

To summarize, the present invention is both novel and non-obvious in view of all cited documents in the official action.

Finally, The Action notes that claim number 19 was skipped in the original application, so that only 26 claims are pending. It is presumed based on this that

claims 20-27 have been treated as claims 19-26 during the examination of this application, since claim 27 was not mentioned in the Action. Kindly advise if this presumption is incorrect.

Respectfully submitted,

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